InterQual®

2011 Imaging Criteria

Nuclear Stress Test, Thallium/Technetium/Sestamibi[1, 2*MDR, 3*RIN, 4, 5]

CLIENT:	Name	D.O.B.		ID#	GROUP#
CPT/ICD9:	Code	Facility		Service Date	
PROVIDER:	Name			ID#	Phone#
	Signature			Date	

ICD-9-CM: 87.42, 89.44

INDICATIONS (choose one and see below)

☐ 100   High CAD risk

☐ 200   ECG abnormalities/drug effect with CAD risk

☐ 300   CAD by prior positive stress test/CAD event

☐ 400   Assess for myocardial ischemia with culprit vessel

☐ 500   Structural heart disease (SHD) with CAD risk

☐ 600   Risk stratification for major surgery

☐ 700   Presyncope/syncope by Hx

☐ 800   Nonsustained (≤ 30 secs) V tach by ambulatory electrocardiography/ECG/EP testing

☐ 900   Newly discovered LV systolic dysfunction

☐ 1000   New onset HF

☐ Indication Not Listed (Provide clinical justification below)

☐ 100   High CAD risk **[One]**[6]
  ☐ 110   Q-waves ≥ 1 mm width and depth by ECG[7]
  ☐ 120   Chest pain by Hx **and** CAD risk factors **[Two]**[8]
    ☐ 121   DM[9]
    ☐ 122   Family Hx of CAD at age < 60[10]
    ☐ 123   Dyslipidemia
    ☐ 124   HTN[11]
    ☐ 125   Cigarette smoking
    ☐ 126   Woman age > 55/postmenopausal[12]
    ☐ 127   Male age > 45
    ☐ 128   Cocaine abuse[13]
  ☐ 130   Risk factors for CAD **[Three]**[8]
    ☐ 131   DM[14]
    ☐ 132   Family Hx of CAD at age < 60[10]
    ☐ 133   Dyslipidemia
    ☐ 134   HTN[11]

☐ 135   Cigarette smoking
☐ 136   Woman age > 55/postmenopausal[12]
☐ 137   Male age > 45
☐ 138   Cocaine abuse[13]

☐ 200   ECG abnormalities/drug effect with CAD risk **[Both]**
   ☐ 210   ECG abnormalities/drug effect **[One]**
      ☐ 211   LVH
      ☐ 212   ST segment depression
      ☐ 213   Patient on digoxin[15]
   ☐ 220   CAD risk **[One]**
      ☐ 221   Q-waves ≥ 1 mm width and depth by ECG[7]
      ☐ 222   Chest pain by Hx **and** CAD risk factors **[One]**[8]
         ☐ -1   DM[9]
         ☐ -2   Family Hx of CAD at age < 60[10]
         ☐ -3   Dyslipidemia
         ☐ -4   HTN[11]
         ☐ -5   Cigarette smoking
         ☐ -6   Woman age > 55/postmenopausal[12]
         ☐ -7   Male age > 45
         ☐ -8   Cocaine abuse[13]
      ☐ 223   Risk factors for CAD **[Two]**[8]
         ☐ -1   DM[9]
         ☐ -2   Family Hx of CAD at age < 60[10]
         ☐ -3   Dyslipidemia
         ☐ -4   HTN[11]
         ☐ -5   Cigarette smoking
         ☐ -6   Woman age > 55/postmenopausal[12]
         ☐ -7   Male age > 45
         ☐ -8   Cocaine abuse[13]

☐ 300   CAD by prior positive stress test/CAD event **[One]**[16, 17]
   ☐ 310   Periodic assessment for ischemia progression[18]
   ☐ 320   Progression of anginal class[19]
   ☐ 330   Prior to discharge after MI hospitalization[20]
   ☐ 340   6 wks post MI[21]
   ☐ 350   Post revascularization and need to stratify rehabilitation candidate
   ☐ 360   Angina/anginal equivalent **[One]**[22, 23]
      ☐ 361   New symptoms

☐ 362   Hx of revascularization

☐ 400   Assess for myocardial ischemia with culprit vessel [Both]$^{(24)}$
   ☐ 410   Stenosis > 50% by angiogram
   ☐ 420   Culprit lesion amenable to PCI$^{(25)}$

☐ 500   Structural heart disease (SHD) with CAD risk [Both]$^{(26)}$
   ☐ 510   CAD risk [One]
      ☐ 511   Q-waves ≥ 1 mm width and depth by ECG$^{(7)}$
      ☐ 512   Chest pain by Hx and CAD risk factors [One]$^{(8)}$
         ☐ -1   DM$^{(9)}$
         ☐ -2   Family Hx of CAD at age < 60$^{(10)}$
         ☐ -3   Dyslipidemia
         ☐ -4   HTN$^{(11)}$
         ☐ -5   Cigarette smoking
         ☐ -6   Woman age > 55/postmenopausal$^{(12)}$
         ☐ -7   Male age > 45
         ☐ -8   Cocaine abuse$^{(13)}$
      ☐ 513   Risk factors for CAD [Two]$^{(8)}$
         ☐ -1   DM$^{(14)}$
         ☐ -2   Family Hx of CAD at age < 60$^{(10)}$
         ☐ -3   Dyslipidemia
         ☐ -4   HTN$^{(11)}$
         ☐ -5   Cigarette smoking
         ☐ -6   Woman age > 55/postmenopausal$^{(12, 27)}$
         ☐ -7   Male age > 45$^{(27)}$
         ☐ -8   Cocaine abuse$^{(13)}$
   ☐ 520   SHD by TTE/TEE [One]$^{(26, 28)}$
      ☐ 521   LVH
      ☐ 522   RVH
      ☐ 523   EF ≤ 40%
      ☐ 524   Valvular heart disease [One]
         ☐ -1   MR
         ☐ -2   AR
         ☐ -3   MS
         ☐ -4   AS ≥ 1.0 cm^2
         ☐ -5   MVP
      ☐ 525   Congenital heart disease$^{(29)}$

☐ 600 Risk stratification for major surgery [One]^(30, 31)

   ☐ 610 CAD by Hx^(32, 33)

   ☐ 620 Canadian Class I/II/III angina⁽³⁴⁾

   ☐ 630 NYHA Class I/II/III HF⁽³⁵⁾

   ☐ 640 Renal insufficiency^(36, 37)

   ☐ 650 DM⁽³⁷⁾

   ☐ 660 Severe valvular disease

   ☐ 670 Cerebrovascular disease by Hx

☐ 700 Presyncope/syncope by Hx [One]^(38, 39)

   ☐ 710 New presyncope/syncope with SHD/CAD [One]

      ☐ 711 SHD by TTE/TEE [One]⁽²⁸⁾

         ☐ -1 LVH

         ☐ -2 RVH

         ☐ -3 EF ≤ 40%

         ☐ -4 Valvular heart disease [One]

            ☐ A) MR

            ☐ B) AR

            ☐ C) MS

            ☐ D) AS ≥ 1.0 cm^2

         ☐ -5 Congenital heart disease⁽²⁹⁾

      ☐ 712 CAD by Hx⁽³²⁾

   ☐ 720 New presyncope/syncope with CAD risk [One]

      ☐ 721 Q-waves ≥ 1 mm width and depth by ECG⁽⁷⁾

      ☐ 722 Chest pain by Hx **and** CAD risk factors [One]⁽⁸⁾

         ☐ -1 DM⁽⁹⁾

         ☐ -2 Family Hx of CAD at age < 60⁽¹⁰⁾

         ☐ -3 Dyslipidemia

         ☐ -4 HTN⁽¹¹⁾

         ☐ -5 Cigarette smoking

         ☐ -6 Woman age > 55/postmenopausal⁽¹²⁾

         ☐ -7 Male age > 45

         ☐ -8 Cocaine abuse⁽¹³⁾

      ☐ 723 Risk factors for CAD [Two]⁽⁸⁾

         ☐ -1 DM⁽⁹⁾

         ☐ -2 Family Hx of CAD at age < 60⁽¹⁰⁾

         ☐ -3 Dyslipidemia

         ☐ -4 HTN⁽¹¹⁾

         ☐ -5 Cigarette smoking

☐ -6   Woman age > 55/postmenopausal[12]

☐ -7   Male age > 45

☐ -8   Cocaine abuse[13]

☐ 730   New exercise-induced presyncope/syncope

☐ 800   Nonsustained (≤ 30 secs) V tach by ambulatory electrocardiography/ECG/EP testing **[One]**

   ☐ 810   Presyncope by Hx **[One]**[40]

      ☐ 811   CAD by Hx[32]

      ☐ 812   SHD by TTE **[One]**[28]

         ☐ -1   LVH

         ☐ -2   RVH

         ☐ -3   EF ≤ 40%

         ☐ -4   Valvular heart disease **[One]**

            ☐ A)   MR

            ☐ B)   AR

            ☐ C)   MS

            ☐ D)   AS ≥ 1.0 cm^2

            ☐ E)   MVP

         ☐ -5   Congenital heart disease[29]

   ☐ 820   Syncope by Hx and CAD risk **[One]**[41]

      ☐ 821   Q-waves ≥ 1 mm width and depth by ECG[7]

      ☐ 822   Chest pain by Hx **and** CAD risk factors **[One]**[8]

         ☐ -1   DM[9]

         ☐ -2   Family Hx of CAD at age < 60[10]

         ☐ -3   Dyslipidemia

         ☐ -4   HTN[11]

         ☐ -5   Cigarette smoking

         ☐ -6   Woman age > 55/postmenopausal[12]

         ☐ -7   Male age > 45

         ☐ -8   Cocaine abuse[13]

      ☐ 823   Risk factors for CAD **[Two]**[8]

         ☐ -1   DM[9]

         ☐ -2   Family Hx of CAD at age < 60[10]

         ☐ -3   Dyslipidemia

         ☐ -4   HTN[11]

         ☐ -5   Cigarette smoking

         ☐ -6   Woman age > 55/postmenopausal[12]

         ☐ -7   Male age > 45

         ☐ -8   Cocaine abuse[13]

☐ 900   Newly discovered LV systolic dysfunction [All][42]
    ☐ 910   EF ≤ 40% [One]
        ☐ 911   By TTE
        ☐ 912   By RVG
    ☐ 920   No valvular heart disease
    ☐ 930   No congenital heart disease[29]

☐ 1000   New onset HF [Both][42, 43, 44]
    ☐ 1010   By PE
    ☐ 1020   By CXR

Notes

(1)
These criteria include the following procedures:
Cardiolite Nuclear Stress Test
Sestamibi (MIBI) Nuclear Stress Test
Single Photon Emission Computed Tomography (SPECT)
SPECT, Technetium
SPECT, Thallium

(2)-MDR:
If any of the following are present, secondary medical review is required:
• AAA ≥ 4 cm
• Thoracic aortic aneurysm ≥ 5 cm
• AS < 1.0 cm^2
• 100% ventricular paced rhythm
• Patient physically unable to exercise or achieve exercise level
• Unstable angina
• LBBB

(3)-RIN:
Cardiac SPECT (single-photon emission computed tomography) is covered by these criteria because the indications for a thallium or technetium SPECT are the same as for a thallium or technetium nuclear stress test.

(4)
Stress testing is performed in a variety of settings: as part of a routine assessment of cardiovascular fitness, preoperatively, post MI, and in patients with suspected CAD. Several noninvasive stress tests are available. The choice of test is based on a number of factors including the patient's resting ECG, their ability to perform exercise, the local expertise available, and the clinical question being addressed. ETT (exercise treadmill testing, with continuous BP, heart rate, and ECG monitoring) is preferred for stress testing in patients with a normal ECG who are able to exercise. Patients with ECG changes that interfere with the interpretation of ETT (e.g., ST depression, digoxin changes, LBBB, pacemaker rhythm) should undergo stress testing with an isotope nuclear stress test (e.g., thallium, technetium, Cardiolite, Sestamibi). Stress echo is particularly helpful if there is concomitant valvular or other structural pathology. If a patient cannot exercise, a Persantine nuclear stress test or a dobutamine stress test may be performed (West and Kramer, Surg Clin North Am 2009; 89(4): 763-780 vii; Sicari et al., J Am Coll Cardiol 2003; 41(4): 589-595).

(5)
SPECT is used for the diagnosis of CAD, the evaluation of the site and extent of jeopardized myocardial tissue, and risk stratification. SPECT provides a 3-D computer-reconstructed image of the heart using isotope imaging, most commonly thallium and technetium, and

provides clearer pictures than other isotope imaging techniques. Areas of decreased radionuclide uptake (perfusion defects) represent cardiac ischemia or scar tissue. Measurement of isotope "wash out" or redistribution is necessary for differentiating scar from areas of true cardiac ischemia. Estimates of overall sensitivity of SPECT for detection of CAD range from 86% to 91%; while specificity is 72% to 74% (Bax et al., Cardiol Clin 2009; 27(2): 265-276; Dilsizian and Narula, Atlas of nuclear cardiology, 2nd ed. c2006).

(6)

The probability of a patient having CAD can be estimated prior to stress testing (pharmacological or exercise) based on history, clinical findings, resting ECG, and atherosclerotic risk factors. One model uses age, gender, and chest pain characteristics to predict risk as low, intermediate, and high. The diagnostic utility of stress testing is best for the patients in the intermediate risk group. This model has been developed for patients between the ages of 30 and 69. Both men and women are considered intermediate to high risk of having CAD when they have typical anginal pain. Atypical angina in all age groups is an intermediate risk except for women in their 30s and 40s who are considered to be low risk. Noncardiac chest pain in men > 40 years old are intermediate risk with women having similar symptoms remaining low risk until they reach their 60s (Hendel et al., J Am Coll Cardiol 2009; 53(23): 2201-2229).

(7)

Q-waves found in the precordial, inferior or lateral leads as listed are considered diagnostic for previous MI:
• Two adjacent precordial leads (V2-V6)
• Two inferior leads (II, III, aVF)
• Both lateral leads (I and aVL)

(8)

A variety of new or emerging risk factors that have the potential to improve global risk assessment for coronary artery disease are being studied. Among these, C-reactive protein, obesity, metabolic syndrome, and coronary artery calcium in particular are the subjects of intense research and scrutiny for their impact. While research continues, these novel approaches to risk assessment are not universally accepted (Helfand et al., Ann Intern Med 2009; 151(7): 496-507).

(9)

DM is considered to be a major risk factor for coronary heart disease. The American Diabetes Association (ADA) recommends that patients with DM be evaluated yearly for dyslipidemia, HTN, smoking, family history of premature CAD, and the presence of albuminuria. Risk reduction treatment should be initiated if any of the findings are modifiable. In addition, further cardiac testing is recommended for patients with typical or atypical chest pain and patients with resting ECG abnormalities. Cardiac screening of asymptomatic patients is considered controversial by the ADA (American Diabetes Association, Diabetes Care 2008; 31 Suppl 1: S12-54).

(10)

Patients are considered to have increased risk for CAD when a first-degree blood relative (e.g., sibling, parent, child) was diagnosed with a cardiac condition (e.g., MI, sudden cardiac death, positive stress test) or underwent a cardiac procedure (e.g., revascularization) before the age of 60.

(11)-DEF:

Hypertension is defined for these criteria as systolic BP > 140 mmHg or diastolic BP > 90 mmHg. In patients with chronic kidney disease or with DM, hypertension may be defined as systolic BP ≥ 130 mmHg or diastolic BP ≥ 80 mmHg.

(12)

At present, hormone therapy is not recommended for the sole or primary indication of coronary protection for women of any age (North American Menopause Society, Menopause 2010; 17(2): 242-255). The question of whether HRT provides cardioprotective benefit in postmenopausal women has been the subject of intense scrutiny, especially in light of the potential risks of such therapy. A systematic review looked at major studies, such as the Heart and Estrogen/Progestin Replacement study (HERS) and the Women's Health Initiative (WHI) study, which evaluated the use of HRT in prevention of chronic diseases including cardiovascular disease. The authors concluded that data did not show significant benefit of HRT over use of placebo in prevention, and in fact some of the data on healthy women who were on continuous HRT for one or more years actually showed significantly higher rates of coronary events (Farquhar et al., Cochrane Database Syst Rev 2009; (2): CD004143). Secondary analysis of the data from the WHI study supports short-term use of HRT for postmenopausal symptoms. Also, women who initiated hormone therapy for symptoms closer to menopause tended to have reduced coronary heart disease risk compared with the increase in coronary heart disease risk among women more distant from menopause (Rossouw et al., JAMA 2007; 297(13): 1465-1477).

(13)

Cocaine has multiple cardiovascular and hematologic effects. Use of this illicit drug leads to the potential for increased myocardial oxygen demand by increasing heart rate, blood pressure and contractility; decreasing oxygen supply through vasoconstriction; and contributing to thrombosis formation by stimulating platelet activation. It also is believed to accelerate atherosclerosis (McCord et al., Circulation 2008; 117(14): 1897-1907).

(14)

The screening of asymptomatic diabetics remains controversial. Diabetics, especially those > age 40 with another risk factor are at increased risk for cardiovascular events. Candidates for cardiac testing include those with typical or atypical cardiac symptoms and an abnormal resting ECG (American Diabetes Association, Diabetes Care 2009; 32 Suppl 1: S13-61).

(15)

In patients on digoxin, exercise ST changes may result from digoxin effects, even if the ECG is normal at rest. In these patients, a nuclear stress test or a stress echo is performed for the diagnosis of ischemic heart disease.

(16)-DEF:

A prior CAD event is defined as a prior MI, admission for angina, a history of angina, HF, a PCI, or CABG.

(17)

A positive stress test includes findings of ischemia or prior infarct. For this criterion, the definition of a positive stress test is used primarily as a historical factor. The severity of the cardiac ischemia defines the necessity of specific diagnostic or therapeutic actions. A positive stress test is defined by one of the following:
• ETT with horizontal ST segment depression ≥ 1 mm by ECG in two contiguous leads, chest pain or a systolic BP decrease of ≥ 10 mmHg during exercise, PVCs, or ventricular tachycardia (these changes may also be seen on nuclear stress or stress echo)
• Nuclear stress test, Persantine nuclear stress test, or dobutamine nuclear stress test with ≥ 1 reversible defect
• Stress echo or dobutamine echo with ≥ 1 area of reduced or worsened wall contractility, left ventricle dilation during testing, or decreasing EF during testing

(18)-POL:

It is a matter of local medical policy to determine the frequency of testing. The need for frequent periodic assessment is rare, because the provider can follow the patient's symptoms and ECG findings. Periodic assessment may be necessary in asymptomatic patients with ECG changes or in patients with silent myocardial ischemia (e.g., diabetic patients).

(19)-DEF:

Angina progression is defined as previously diagnosed angina that is distinctly more frequent, longer in duration, or lower in threshold, and is increased by one Canadian class within the last several months to at least Canadian Class III severity.

(20)

Patients who have not received fibrinolytic therapy or a revascularization procedure during their admission for an MI can benefit from exercise stress perfusion scanning when baseline ECG is abnormal. The objective of the testing is to provide risk stratification, evaluate for possible revascularization, or determine inducible ischemia. Testing can be done as soon as 4 days after the MI in stable patients (pre or post discharge) (Antman et al., J Am Coll Cardiol 2004; 44(3): E1-E211).

(21)

A nuclear stress test will help determine the severity and location of coronary disease and is preferred to an ETT in these instances.

(22)-DEF:

Angina pectoris is defined as discomfort in the chest associated with myocardial ischemia. Symptoms of angina may vary from patient to patient and include sensations of pain (classically involving the chest with radiation to the left arm), choking, pressure, squeezing, tightness, heaviness, or burning. Isolated shoulder, back, neck, and jaw complaints can also be described.

(23)

As a significant number of patients with acute MI do not have classic symptoms of chest pain, it is important to consider atypical angina (also known as an anginal equivalent) when evaluating a patient with risk factors or a history of CAD (Anderson et al., J Am Coll Cardiol 2007; 50(7): e1-e157). Atypical presentations are seen more frequently in women, the elderly, and diabetic patients and may include jaw or neck pain, nausea with vomiting, dyspnea and unexplained fatigue (Amsterdam et al., Circulation 2010: July 26, 2010; Berg et al., Gend Med 2009; 6(3): 454-462).

(24)

A patient with one or more coronary artery stenoses may have ischemia in the distribution of one particular artery. This artery is known as the culprit vessel.

(25)-DEF:

Percutaneous coronary intervention (PCI) is the opening of a stenosed coronary vessel by means of balloon angioplasty, stent insertion, atherectomy, or combination thereof.

(26)

Structural heart disease that is not listed may not require a stress echo or nuclear stress test for evaluation of CAD risk (e.g., MR 1+/2+). Alternatively, valvular disease of sufficient severity with CAD risk should be evaluated by other means (e.g., angiogram).

(27)

Asymptomatic patients in the listed age groups may benefit from stress testing when they are initiating an exercise program or have a condition associated with elevated risk of CAD (e.g., PAD, chronic renal failure) (Gibbons et al., Circulation 2002; 106(14): 1883-1892).

(28)

Structural heart disease (SHD) includes LVH, RVH, asymmetric septal hypertrophy, left ventricular systolic dysfunction, valvular heart disease or congenital heart disease. SHD is most commonly documented by TTE or occasionally by TEE.

(29)

Congenital heart disease in adults is, most commonly, ASD, VSD, or pulmonic stenosis. These criteria do not cover complex congenital heart disease.

(30)-DEF:

Major surgery is defined as a major vascular procedure (e.g., AAA repair, thoracic aneurysm repair, a proximal intra-abdominal procedure), peripheral vascular surgery, thoracic surgery, lengthy abdominal surgery, or abdominal surgery with large fluid requirements.

(31)

Preoperative cardiac work-up should include evaluation for active cardiac conditions (e.g., unstable coronary syndromes, decompensated HF, arrhythmias, valve disease) that would require assessment and treatment before noncardiac surgery, assessment of clinical risk factors and functional capacity, and consideration of the procedure-specific risk. The more predictors a patient has, the greater the risk of perioperative complications (e.g., MI, pulmonary embolism, ventricular fibrillation, cardiac arrest). Functional capacity may also be a determining factor to a patient's outcome. Limitations such as inability to climb two flights of stairs or walk four blocks have been associated with increased perioperative complications (Fleisher, Cleve Clin J Med 2009; 76 Suppl 4: S9-15; Fleisher et al., Circulation 2007; 116(17): 1971-1996).

(32)

Patients are considered to have a history of CAD when they have had symptoms of angina or an anginal equivalent, or have had a previous MI, CABG, PCI, or positive stress test.

(33)

Patients who have had a revascularization procedure within 5 years of the planned surgery without a change in their cardiac status are considered to be low risk for cardiac events during the perioperative period. Clinical judgment based on past and present medical conditions will dictate which patients need cardiac testing.

(34)

Canadian Class I/II/III angina:

I.   Ordinary physical activity, such as walking and climbing stairs, does not cause angina. Angina with strenuous or rapid or prolonged exertion at work or recreation

II.   Slight limitation of ordinary activity. Walking or climbing stairs rapidly, walking uphill, walking or stair climbing after meals, in cold, in wind, or when under emotional stress, or only during the few hours after awakening. Walking more than two blocks on level ground and climbing more than one flight of stairs at a normal pace and in normal conditions

III.   Marked limitation of ordinary physical activity. Walking one to two blocks on level ground or climbing more than one flight in normal conditions

(35)
New York Heart Association Class I/II/III CHF:

I.   With cardiac disease but without resulting limitations of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea, or anginal pain.
II.   Slight limitation of physical activity. Comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea, or anginal pain.
III.   Marked limitation of physical activity. Comfortable at rest. Less than ordinary physical activity causes fatigue, palpitation, dyspnea, or anginal pain.

(36)
For the purposes of these criteria, a patient would be considered to have renal insufficiency if their serum creatinine level is > 2 mg/dL(177 µmol/L), there is ≥ 50% increase over an abnormal baseline, or if the patient requires dialysis prior to the procedure (Fleisher et al., Circulation 2007; 116(17): 1971-1996). Kidney function is frequently measured by glomerular filtration rate (GFR). According to the National Kidney Foundation, patients have chronic kidney disease when the GFR is < 60mL/min/1.73m^2 for 3 or more months.

(37)
DM and renal insufficiency are recognized as intermediate risk factors for increasing perioperative cardiovascular complications in patients undergoing noncardiac surgery. Stress testing can identify underlying cardiac conditions so that a treatment regimen can be developed which can minimize potential complications in the perioperative period and beyond. Patients at high risk for cardiac complications based on stress testing may require coronary angiography and the delay of the elective procedure while additional measures are incorporated to ensure a successful surgical outcome (Fleisher et al., Circulation 2007; 116(17): 1971-1996).

(38)-DEF:
Syncope is the transient loss of consciousness and postural tone caused by diminished cerebral blood flow. It is characterized by rapid onset, short duration, and spontaneous complete recovery.
Presyncope is an episode of near-fainting or a sign of impending loss of consciousness. Symptoms include, but are not limited to, dizziness, lightheadedness, blurred vision, and general unsteadiness.

(39)
Patients with syncope who sustain significant injury to themselves or others (e.g., motor vehicle accident resulting from syncope) should receive aggressive evaluation since they have a high probability of malignant ventricular arrhythmias. Hypovolemia is a common noncardiac cause of presyncope or syncope and should be ruled out prior to considering stress testing.

(40)-DEF:
Presyncope is an episode of near-fainting or a sign of impending loss of consciousness. Symptoms include, but are not limited to, dizziness, lightheadedness, blurred vision, and general unsteadiness.

(41)-DEF:
Syncope is the transient loss of consciousness and postural tone caused by diminished cerebral blood flow characterized by rapid onset, short duration, and spontaneous complete recovery.

(42)
Patients may have LV dysfunction with or without symptoms of heart failure. Clinicians may suspect LV dysfunction based on abnormal findings (e.g., ECG, x-ray, BP, heart sounds) or past history (e.g., DM, MI, arrhythmia, embolic event). Nuclear imaging can provide evidence about the etiological factors of the heart failure by the perfusion pattern (Hendel et al., J Am Coll Cardiol 2009; 53(23): 2201-2229). When CAD is determined to be the cause of the heart failure or LV dysfunction, revascularization can improve long-term outcomes (Bax et al., Cardiol Clin 2009; 27(2): 265-276).

(43)-DEF:
Heart failure (HF) is a clinical syndrome marked by passive congestion of the pulmonary (venous) vasculature. This results from systolic or diastolic dysfunction. Left-sided heart failure is most common, causing dyspnea with or without exertion, paroxysmal nocturnal dyspnea, and orthopnea. Right-sided heart failure is most commonly a result of left ventricular failure, but can also occur

secondary to chronic pulmonary disease. Findings associated with right heart failure include peripheral edema and hepatomegaly. Risk factors for HF include CAD, HTN, cigarette smoking, LVH, valvular heart disease, and DM (Jessup et al., Circulation 2009; 119(14): 1977-2016).

(44)

The etiology of a patient's fatigue or dyspnea can be heart failure or noncardiac conditions such as advanced aging, obesity, pulmonary disease, or deconditioning. Determining if heart failure is the cause of the activity intolerance can be achieved by exercise testing. In addition, all patients should be prescribed an exercise program and defining the limits of this regimen can be accomplished through stress testing once heart failure is adequately controlled (Hunt et al., J Am Coll Cardiol 2009; 53(15): e1-e90).